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POSTTRAUMATIC STRESS DISORDER SYMPTOMS AMONG NAVY RECRUITS

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Abstract

Individuals in the military are often required to endure high levels of stress as a result of demanding operational requirements or deployments. Individuals who enter the military with pre-existing mental health problems such as posttraumatic stress disorder (PTSD) are likely to be at heightened risk of adverse reactions to military stressors. The present study documents the prevalence of PTSD symptoms among new Navy recruits and compares the prevalence of PTSD symptomatology among recruits to prevalence rates that have been reported for comparable civilian populations. Results suggest that 15% of new Navy recruits are experiencing measurable symptoms of PTSD. PTSD prevalence among Navy recruits is comparable to the prevalence among civilian adolescent and young adult populations.

Introduction

PTSD is a relatively new diagnosis within the mental health field. The American Psychiatric Association formally recognized it in the third edition of the Diagnostic and Statistical Manual of Mental Disorders.[1] PTSD arises in response to an identified traumatic experience and is characterized by three types of symptoms, all of which must be present for the diagnosis: (a) reexperiencing the trauma, for example, through flashbacks; (b) avoidance of situations reminiscent of the traumatic experience, as well as numbing of emotional responses; and (c) a state of hyperarousal or vigilance toward cues that might signal the recurrence of the traumatic event.

The theoretical concept of PTSD was developed and gained widespread acceptance during the Vietnam War era. The conceptualization of PTSD at that time was intertwined with advocacy movements for Vietnam-era veterans.[2] Because the diagnosis was tied to a specific external cause, it could be used to justify assistance and treatment, without the stigmatization associated with other diagnoses.[3] Today, studies of PTSD among Vietnam-era veterans are ubiquitous in the trauma literature.[4]

In the general population, traumatic experiences severe enough to lead to PTSD are prevalent. For example, in a nationally representative sample of women, Resnick, Kilpatrick, Dansky, Saunders, and Best found that 69% had been victims of a serious crime (rape, sexual or physical assault, homicide of a friend or family member) or had experienced a life-threatening situation (natural disaster, serious accident, injury).[5] Among those who had experienced a traumatic event, the lifetime rate of PTSD was 18%, with 7% reporting qualifying symptoms within the previous 6 months. Breslau, Kessler, Chilcoat, Schultz, Davis, and Andreski reported that 90% of a representative Midwestern community sample had experienced some type of

trauma that might lead to PTSD.[6] The prevalence of PTSD among participants based on type of trauma experience ranged from less than 1% to 54%. Similarly, Brewin, Andrews, Rose, and Kirk identified PTSD in 20% of their sample 6 months following a violent assault.[7]

Because military personnel are recruited from the general population, some proportion of recruits is likely to have experienced premilitary trauma and to have some pre-existing symptoms of PTSD.[8-10] Military service often entails a high degree of stress as a result of demanding operational requirements or deployments. The threat of combat injury or capture presents an additional set of stressors for those who are deployed. Persons who enter the military with pre-existing mental health problems including PTSD symptoms may be more likely to have adverse reactions to the stress of military training and or combat operations.[11, 12] In particular, persons who have been exposed to trauma and already are experiencing symptoms of PTSD may have counterproductive coping strategies such as suicidality and hostility or more extensive personality disorders.[13-15]

There is little basis for predicting what the prevalence of PTSD might be among recruits and whether and how it might differ from that of the general population. A few studies have examined the prevalence of PTSD among military operational units prior to deployment. For instance, a study including Army personnel preparing for Operation Iraqi Freedom found that between 5% and 9% suffered from PTSD, depending on the strictness of the definitional criteria.[16] Another study of Army personnel preparing for a peacekeeping mission found that 74% of participants reported prior traumatic experiences, and 6% could be classified with PTSD.[17] In this study, 30% of the previous trauma incidents reported occurred during earlier deployments.

In studies of deploying units it is difficult to know how representative participants are of the total military population. Furthermore, recruits have not yet experienced the military socialization process or any trauma associated with military service. Recruits differ from the general population only in that they have gone through the enlistment process and elected to join the military. Military selection and self-selection in the military recruit population may itself be associated with PTSD prevalence. To examine these issues in the present study, we assessed the prevalence of PTSD symptoms among Navy recruits in basic training and compared these rates with the prevalence of PTSD reported in previous studies of comparable civilian populations.

Method

Data for this report came from the Naval Health Research Center Survey of Navy Recruits. As part of a larger survey, participants in this study were assessed for symptoms of PTSD during their first week of basic training.[8-10] A subgroup of these participants was subsequently followed over a 2-year period in order to assess their adjustment to military life. This is the first report in a series regarding PTSD symptomology among Navy recruits, and only includes data from the baseline assessment.

Participants

Between June 1996 and June 1997, 11,195 U.S. Navy recruits at the Recruit Training Command, Great Lakes, IL were surveyed. (Due to missing data, *n*'s vary slightly across analyses and are reported individually.) The survey was offered to all available recruits in gender-integrated units during their first week of training. Response rates were high (97% for men, 96% for women). Just under half of the participants (47%; $n = 5226$) were female. The

majority were high school graduates (83%), between 18 and 20 years old (70%), single with no children (84%), and White (61%).

Approximately half (n = 5,498) of the recruits were asked to provide identifying information in order to be included in the longitudinal study; the remainder participated anonymously. Participants in the identified and anonymous survey conditions were demographically similar, with no significant differences in terms of gender, ethnicity, income level in family of origin, or parental marital status. There were some small demographic differences. On average, anonymous participants were slightly older (mean = 19.85) on average than were identified participants (mean = 19.69), $p < .001$, d = .06. Although the majority of both groups was single, slightly more participants in the anonymous condition (11%) than in the identified condition (9%) reported being married or cohabiting, $p < .01$, $w = .04$. Anonymous participants were also more likely (6%) than were identified participants (4%) to report some college education, $p < .001$, $w = .04$.

Because of the large numbers of participants in this study, very small effects can be detected. Therefore, in addition to statistical significance, we used a small effect size $r = .10$ ($d = .20$ or $w = .10$), as defined by Cohen, as a minimum criterion for substantive results.[18] The differences in age, marital status, and education level by survey condition did not meet this criterion.

Instruments

Los Angeles Symptom Checklist (LASC). The Recruit Survey used the 17-item version of the LASC to assess PTSD.[19] Respondents rated the extent to which specific symptoms were a problem for them prior to basic training, using a 5-point scale ranging from 0 (*no problem*) to 4 (*extreme problem*). The 17 symptoms comprise subscales representing the three classes of

symptoms required for a diagnosis of PTSD. Using standard scoring for the LASC, participants had elevated subscale scores if they responded with a rating of "2" or higher to at least one of three Reexperiencing Trauma symptoms, three of six Avoidance & Emotional Numbing symptoms, and two of eight Hyperarousal symptoms. Elevated scores on one or two subscales indicated partial PTSD, and elevated scores on all three suggested full PTSD.

Trauma Symptom Inventory (TSI). The TSI was used as a second measure of psychological symptoms related to trauma.[20] This 100-item measure has 10 clinical subscales assessing a range of symptoms, including those associated with PTSD. Participants were asked how frequently they experienced specific symptoms in the past 6 months on a scale from 0 (*never*) to 3 (*often*). The clinical scales have been internally consistent across diverse populations, with alpha coefficients averaging between .84 and .87. Scale scores are computed by summing responses to specific subsets of eight to nine items each. Based on the standard deviations and mean scores of normative civilian male and female samples, raw scores were converted to T scores centered at 50 with a standard deviation of 10. A T score of 65 is the clinical cutoff for all 10 scales. [20]

The Intrusive Experiences, Anxious Arousal, and Defensive Avoidance scales correspond with the primary symptom clusters of PTSD.[21] Because, there is no standard method for PTSD classification using the TSI, we used a classification scheme similar to that used with the LASC. Participants with scores above the clinical cutoff on all three scales were categorized with full PTSD; participants with scores above the clinical cutoff on one or two were categorized with partial PTSD.

Results

Table I shows the percentage of study participants symptomatic on each of the three PTSD symptom clusters, as well as with full and partial PTSD. Using the LASC, 15% to 17% of participants were classified as having PTSD, and an additional 18% to 19% were classified as having partial PTSD. Using the exploratory TSI classification strategy, 3% to 4% of the participants were classified as having full PTSD, and 16% to 18% were classified with partial PTSD.

Survey Condition

Correlations between corresponding continuous subscale scores and total scores on the LASC and TSI were substantial and similar for participants in the identified (reexperiencing: r = .71; arousal: r = .72; avoidance: r = .62; total score: r = .77) and anonymous (reexperiencing: r = .72; arousal: r = .73; avoidance: r = .65; total score: r = .79) survey conditions. On every TSI and LASC scale and subscale, except for the TSI intrusive experiences subscale, PTSD prevalence was significantly higher in the anonymous than in the identified survey condition. This likely reflects a greater willingness to disclose information that might not be socially desirable among participants in the anonymous condition. However, effect sizes were quite small, ranging from .02 to .04. Thus, survey condition accounted for less than 0.2% of the variability in self-reported PTSD symptoms. We therefore combined data across the two survey conditions for the rest of the analyses in this report.

Classification

Because there is no standard PTSD classification scheme for the TSI, we used Cohen's kappa to evaluate agreement between the TSI and the LASC in the classification of participants with full PTSD.[22] Kappa was significant ($p < .001$), but low (.24). Compared with the LASC, the

TSI categorized far fewer participants as having PTSD. Of 330 persons classified with full PTSD on the TSI, 285 (86%) were classified as such using the LASC, and an additional 35 (11%) were classified with partial PTSD. Only 6 (2%) were PTSD negative (4 were missing LASC scores). Conversely, of 1,741 participants classified with full PTSD on the LASC, 607 (35%) were classified as PTSD negative on the TSI and 820 (47%) were classified with only partial PTSD. Only 16% of the personnel classified as having full PTSD on the LASC were also classified as having full PTSD on the TSI (29 had missing TSI scores). Altogether, 1,678 participants (15%) were classified as having at least partial PTSD on both measures, and 4,040 (36%) were classified as having either full or partial PTSD on at least one of the two.

Civilian Comparison

The availability of normative civilian data for the TSI facilitates comparison with the military population in this study. Since we computed T scores based on these normative data, scale score means should be equal to 50 if the same PTSD symptom prevalence is found among our participants, as was noted in the normative population. We did find that means were very close to 50 for all three subscales (anxious arousal: 49.65; intrusive experiences: 51.36; defensive avoidance: 52.12) and for the average total score (51.04). Nonetheless, mean scores in the present sample were significantly different from 50 for every subscale and for the total score. For anxious arousal and reexperiencing, effect sizes were less than $d = .20$, and therefore did not meet our criterion for substantive significance; for defensive avoidance, however, the criterion was met ($d = .21$). This indicates that military personnel in our sample reported more symptoms reflecting defensive avoidance than did members of the normative civilian sample.

There are no standard normative population data for the LASC. However, Table II compares PTSD scale means and prevalence rates for Navy participants with scale means and

prevalence rates from previous studies that have used the LASC with civilian youths and young adults. Adjusted means in the last column of the table were computed as a weighted sum of the mean scores for male and female Navy participants using the percentages of men and women in the civilian comparison group as the weights. These adjusted figures estimate what the Navy mean would have been, if the Navy sample had the same gender distribution as the civilian comparison sample. Actual and adjusted mean LASC scores for Navy personnel were below means for civilians in every sample but one.[19, 23] In this case, the adjusted mean for the Navy was not significantly different from the comparison group mean.

Data for the Midwestern college sample were most comparable to those of the present study because the same survey methods and instruments were used in both cases.[24] The means for these two groups were quite similar and were not significantly different. In addition, we were able to compare LASC PTSD classification data for this civilian group with LASC classifications for Navy recruit participants. The percentage of participants identified with PTSD across the two studies was similar for both men (civilian: 14% partial, 15% full; Navy: 15% partial, 14% full) and women (civilian: 22% partial, 16% full; Navy: 22% partial, 19% full). There were no significant differences.

Discussion

This study used two different survey measures of PTSD to document the prevalence of this disorder among new Navy recruits entering basic training. It also compared the prevalence of PTSD symptomatology among Navy recruits with prevalence rates in civilian samples of a similar age. Using the LASC, we found that 15% to 17% of participants could be categorized as having PTSD. In contrast, the TSI-based measure categorized only 3% to 4% of our sample as

having full PTSD. Because this measure does not have a standard scoring procedure, TSI-based classifications should be considered experimental. Additionally, the TSI instructions were more time-specific, asking participants to think about their symptoms only within the 6 months prior to basic training. For the LASC, participants were to consider their symptoms any time prior to basic training. Despite this, total symptom scores on both measures were highly correlated ($.77 \leq r \leq .79$), with approximately 60% overlap. Furthermore, 15% of participants were classified with either partial or full PTSD on both measures. This suggests that more than 1 out of 10 Navy recruits had measurable symptoms of PTSD prior to entering basic training.

The prevalence of PTSD among study participants was similar to what has been noted in studies of civilians. Participants did tend to have somewhat elevated symptoms on the TSI subscales, but in most cases not substantively so. Military personnel in this sample did report more symptoms reflecting defensive avoidance than did the normative civilian sample.[20] In contrast to results using the TSI, LASC scores for participants in this study tended to be lower or statistically equivalent to scores for demographically comparable groups of civilians. Although the present findings should be replicated in other branches of the service, our tentative conclusion is that individuals entering the military are similar to their civilian counterparts in terms of PTSD symptomatology.

This is the first study to explore PTSD in a representative population of Navy recruits. Unlike most PTSD research, our sample came from a nonclinical, nonveteran population. Participants represented a wide range of socioeconomic backgrounds. The large sample size was both a benefit and a challenge. It allowed us to reliably identify small effects in our data. However, some of these effects may be too small to be substantively important, making it

necessary for us to consider effect size, in addition to statistical significance, as criteria for substantive importance.

Like much large-sample research, the present study relied on self-report measures. Self-report data have been criticized for potential response bias. Social desirability factors may particularly influence responses to questions about mental health issues, because participants may be reluctant to admit that they have psychological problems. However, in the absence of a formal clinical assessment and diagnosis of posttraumatic stress disorder, self-reports are typically the method of choice in this domain. Nonetheless, it is possible that a mental health professional conducting a face-to-face interview would be able to establish rapport with the participant, eliciting his or her cooperation and thereby gaining a more accurate diagnostic picture. Undoubtedly, however, such research would be limited to a smaller number of participants.

Despite its limitations, the present research provides military leaders and mental health care providers with an estimate of the scope of PTSD among personnel as they enter the service. This disorder is obviously not just a problem for veterans of combat, and is an issue that should be addressed among all military personnel. In particular, it should be considered in planning for deployment and in estimating the vulnerability of personnel exposed to severe trauma during military operations.

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TABLE I

PERCENTAGES OF PARTICIPANTS MEETING CRITERIA FOR POSTTRAUMATIC STRESS DISORDER (PTSD) DURING THE FIRST WEEK OF NAVY BASIC TRAINING

	LASC		TSI	
PTSD Symptomatology	Identified	Anonymous	Identified	Anonymous
Reexperiencing	39	42	12	13
Avoidance	22	24	13	14
Arousal	43	45	6	8
PTSD categorization				
No PTSD	67	64	81	78
Partial PTSD	18	19	16	18
PTSD	15	17	3	4
Total score				
M	12.85	13.68	50.82	51.25
SD	11.69	12.49	8.62	8.95

Note: LASC, Los Angeles Symptom Checklist[19];TSI, Trauma Symptom Inventory.[20] Due to missing data, LASC *n*'s range from 5,254 to 5,309 for identified participants, and from 5,344 to 5,419 for anonymous participants. TSI *n*'s range from 5,320 to 5,355 for identified and 5,411 to 5,470 for anonymous participants. With the exception of TSI intrusive experiences, all scale and subscale percentages and means were significantly different across survey condition, $p < .05$. However, effect sizes were quite small, ranging from .02 to .04.

TABLE II

AVERAGE PTSD SCORES ON THE LOS ANGELES SYMPTOM CHECKLIST: COMPARISON OF STUDY PARTICIPANTS WITH ADOLESCENT AND YOUNG ADULT CIVILIAN POPULATIONS

Population	Mean	SD	Navy Adj.[a]
Navy recruits	13.27	12.10	--
Midwestern college students[24]	13.57	11.60	13.37
Urban adolescents[25]	16.31	NR	13.72
Urban adolescents[26]	16.19	12.57	13.40
Delinquent male adolescents[19, 27]	21.39	12.65	11.79
Continuation school youth[19, 23]	12.29	10.63	12.48

Note: NR, not reported. [a]Means for the Survey of Navy Recruits in this column were adjusted for the gender distribution of the civilian comparison population.

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14. ABSTRACT (maximum 200 words)

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